

5-15-20

Ransome UNIT Construction

Concrete architecture

RANSOME ENGINEERING COMPANY

REINFORCED CONCRETE EXPERTS

NINETY WEST STREET

NEW YORK CITY

N. Y.

SOME BUILDINGS ERECTED BY THE RANSOME COMPANIES.

Bourne & Wise	-	-	Wine Cellars,	St. Helena, Cal.
Academy of Sciences	-	-	Museum,	San Francisco, Cal.
Leland Stanford, Jr., University			Museum,	Palo Alto, Cal.
Leland Stanford, Jr., University			Dormitory,	Palo Alto, Cal.
Pacific Coast Borax Co.	-	-	Factory,	Alameda, Cal.
Pacific Coast Borax Co.	-	-	Factory,	Bayonne, N. J.
Kelly & Jones Co.	-	-	Machine Shop,	Greensburg, Pa.
Nassau County, N. Y.	-	-	Court House,	Mineola, L. I.
Nassau County, N. Y.	-	-	Jail,	Mineola, L. I.
H. Floy & Co.	-	-	Power Plant,	Cuddyville, N. Y.
Coe Brass Mfg. Co.	-	-	Machine Shop,	Torrington, Conn.
Atlantic Insulated Wire & Cable Co.,			Factory,	Stamford, Conn.
United Coke & Gas Co.	-	-	Plant,	New York City.
Sterling Salt Co.	-	-	Bins and tower,	Cuylerville, N. Y.
North Western Ohio Bottle Mach. Co.,			Machine Shops,	Toledo, Ohio *
Bergen Port Sulphur Works	-	-	Factory,	Bayonne, N. J.
Foster-Armstrong Piano Co.	-	-	Factory,	East Rochester, N. Y.
United Shoe Machinery Co.	-	-	Machine Shops,	Beverly, Mass.

Some of these buildings are amongst the largest in the world :

THE FOSTER-ARMSTRONG PLANT (The American Piano Co.) comprises five buildings 60 x 250, each three stories high, one building 80 x 600, two stories high, one office building, three stories high, and half a dozen one story buildings, of which one is 60 x 200 and one 80 x 250.

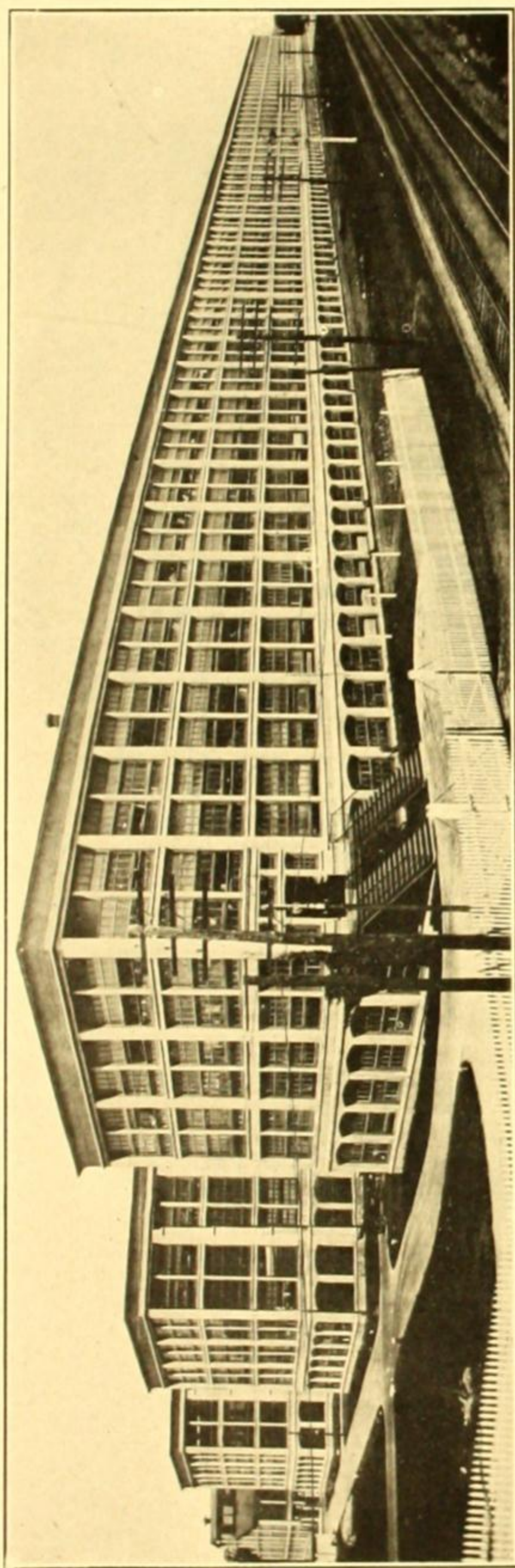
THE UNITED SHOE MACHINERY PLANT has three buildings, each 60 x 1200, four stories high, six connecting buildings, each 60 x 120, six stories high, a two-story foundry building, a one story drop forge building, a power house, etc., etc., the latter group of buildings forming a fourth row 1200 feet long. In addition, there is the new drop forge building of irregular size. In these buildings, between four and five thousand employees work.

We give on the following pages some views of these buildings, together with letters received from the owners.

* Constructed by The Henry Spieker Co. of Toledo.
Designed by Ransome Co. See page 10

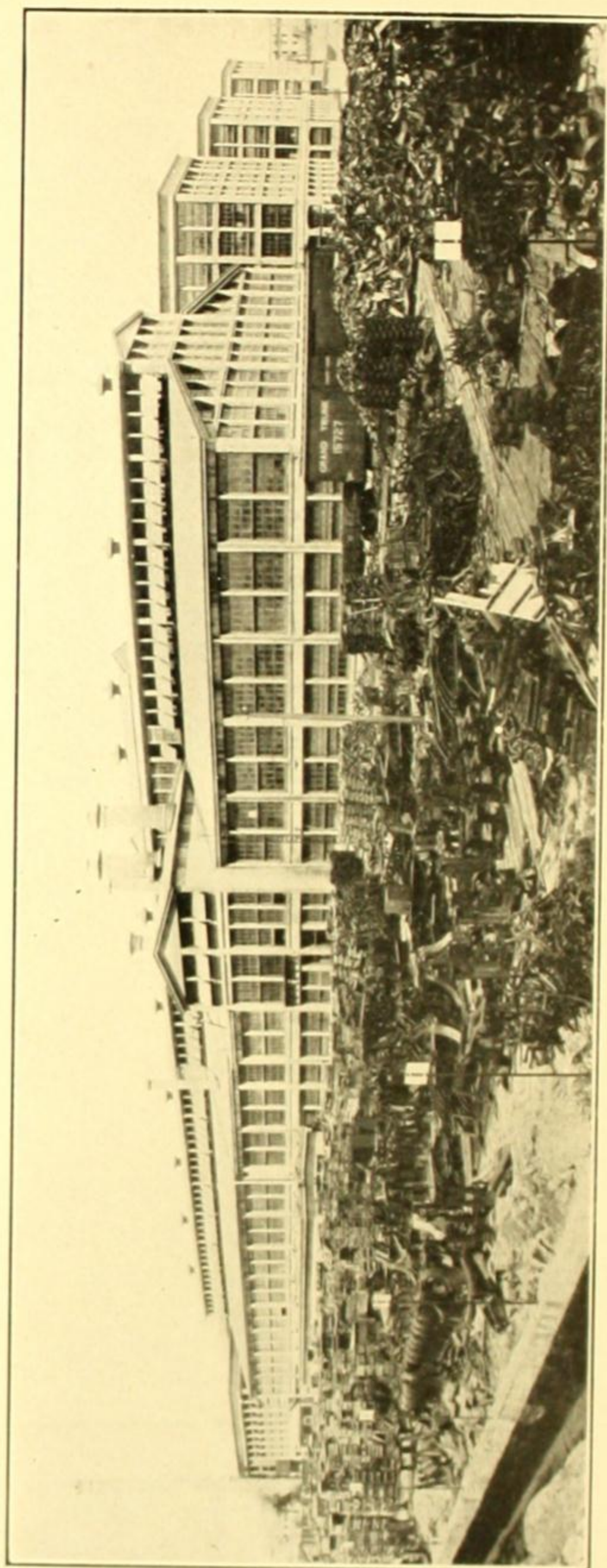
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UNITED SHOE MACHINERY COMPANY.



Front of Main Buildings.

UNITED SHOE MACHINERY COMPANY.



Rear of Foundry.

UNITED SHOE MACHINERY COMPANY
ALBANY BUILDING
BOSTON, MASS.

July 3, 1912.

Mr. Ernest L. Ransome,
President, Ransome Engineering Co.,
90 West Street, New York City.

Dear Sir :

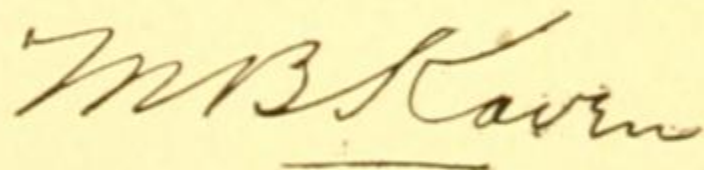
In regard to our reinforced concrete factory at Beverly, Mass., we beg to say that the total floor area of the buildings is 20 acres, erected at different periods during the past eight years. We employed you as our consulting engineer on the original buildings and gave you the contracts on a cost-plus-fixed-sum basis on all the subsequent extensions, four in all, which were redesigned by you. During all this time, our confidence in your ability to get results at low figures has constantly increased, and we note with particular pleasure the excellent workmanship done during the last two years, during which time you have used your "Unit" System exclusively, thereby saving us material expenditures of money as compared with the ordinary method of construction of reinforced concrete buildings used on the original buildings and the first extensions.

Your Unit System has called forth universal approval, and we recommend it strongly. Our new buildings are similar in general architectural design to our older works, while the new buildings are greatly superior in regard to appearance, the lines being very true and straight ; so that we feel free to endorse the "Ransome Unit Construction" to anybody contemplating the erection of such buildings. In fact, visitors to our factory are always welcome, and we shall be pleased to point out to them the superiority of your new construction.

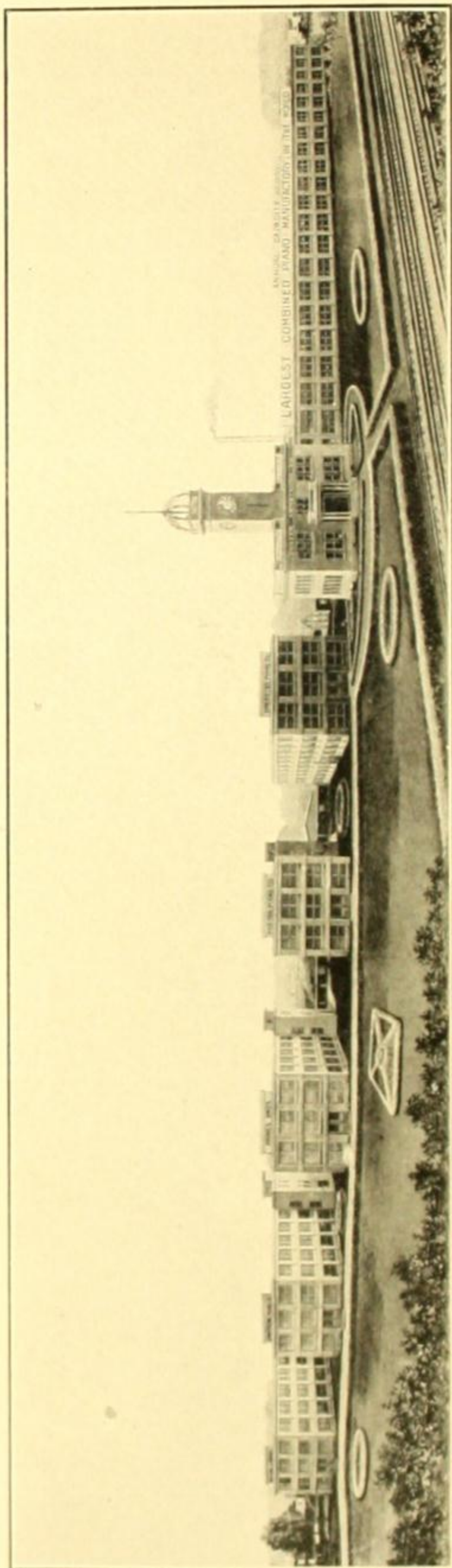
Yours very truly,

UNITED SHOE MACHINERY COMPANY,

By

A handwritten signature in dark ink, appearing to read "W.B. Kaven". The signature is written in a cursive, flowing style with a horizontal line underneath the name.

MBK—AAK



AMERICAN PIANO COMPANY

KNABE BUILDING

FIFTH AVE. COR. 39th STREET

The Ransome Engineering Co.,
Mr. Ernest L. Ransome, Pres.,
90 West St., N. Y. C.

New York, June 25, 1912.

Gentlemen :

Complying with your recent request, the Foster-Armstrong Co. are very glad indeed to say that the buildings which you erected for them under the Ransome system have been everything that you recommended them to be ; have given us splendid service and an abundance of light and extremely easy to heat in cold weather.

WBA—EL

Yours very truly,

W. P. Armstrong

Vice-President.

ATLANTIC INSULATED WIRE & CABLE CO.

120 LIBERTY ST., NEW YORK

FACTORY
STAMFORD, CONN.

Stamford, Conn., July 1, 1912.

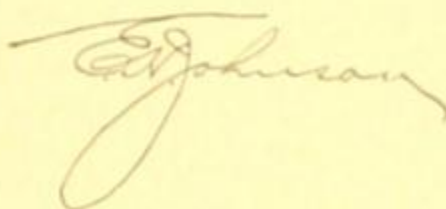
Mr. Ernest L. Ransome,
Ransome Engineering Company,
90 West St., New York City.

Dear Sir :

In answer to yours of the 20th ult., which, due to absence of the writer, has been held up until the present, we would advise that the buildings you have erected for us have been most satisfactory in every way, and we have nothing but praise to offer for the manner in which the construction work was handled and the quality of the completed buildings.

Very truly yours,

ATLANTIC INSULATED WIRE & CABLE CO.



EHJ-D

Vice-President.

THE AMERICAN BRASS COMPANY

THE COE BRASS BRANCH
TORRINGTON, CONN.

June 24th, 1912.

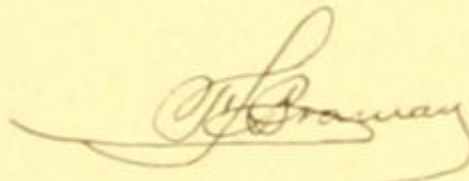
Ransome Engineering Company,
Mr. Ernest L. Ransome, President,
90 West Street, Cor. West & Cedar Sts.,
New York, N. Y.

Gentlemen :

Your letter of June 20th received. We beg to say in reply that we have no photographs of the two buildings, which you made for us of reinforced concrete. These buildings, however, are proving very satisfactory for their purposes and we are very pleased with them.

Yours very truly,

THE AMERICAN BRASS COMPANY,



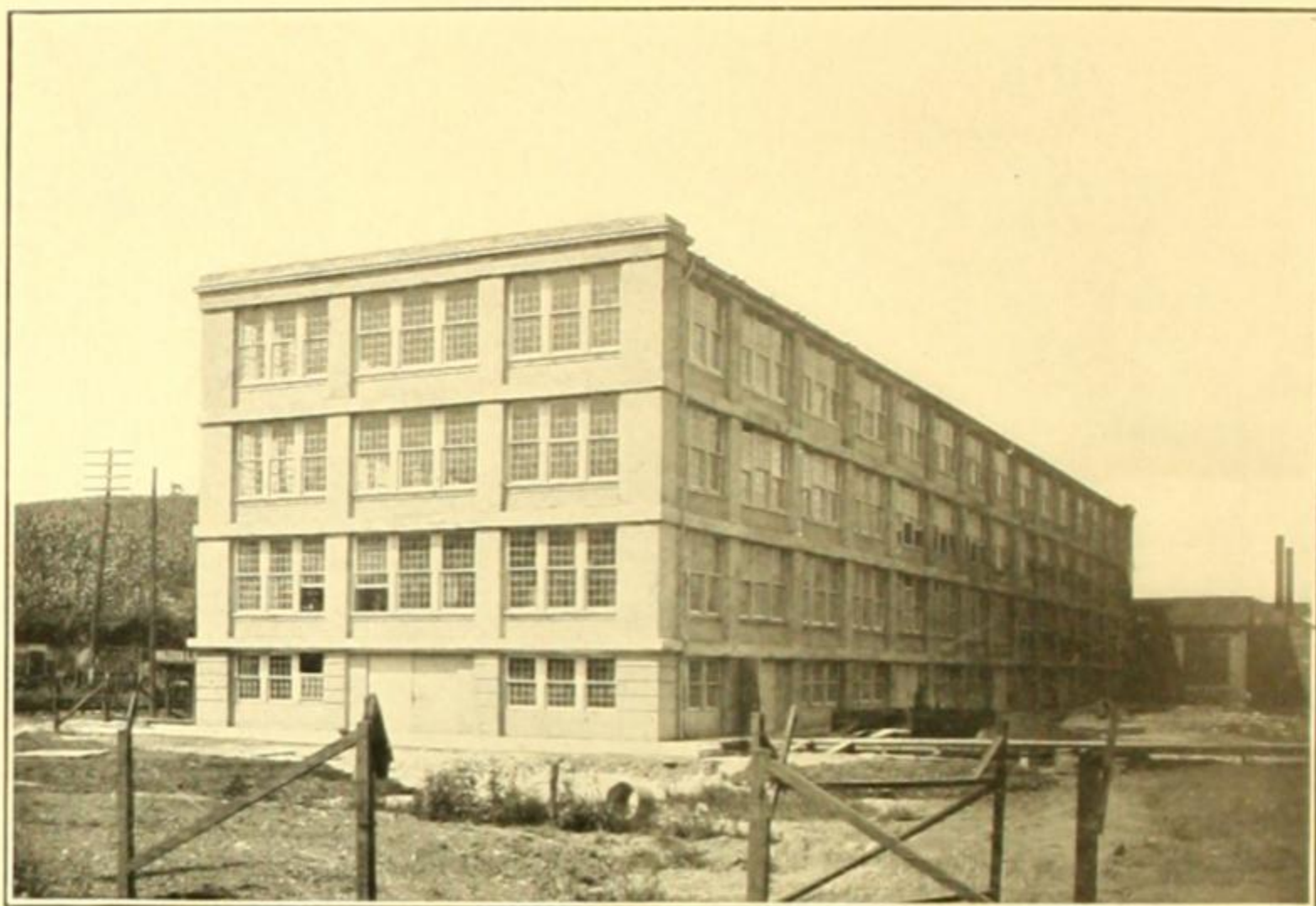
Assistant Manager.

M.

COE BRASS BRANCH.

KELLY & JONES CO.

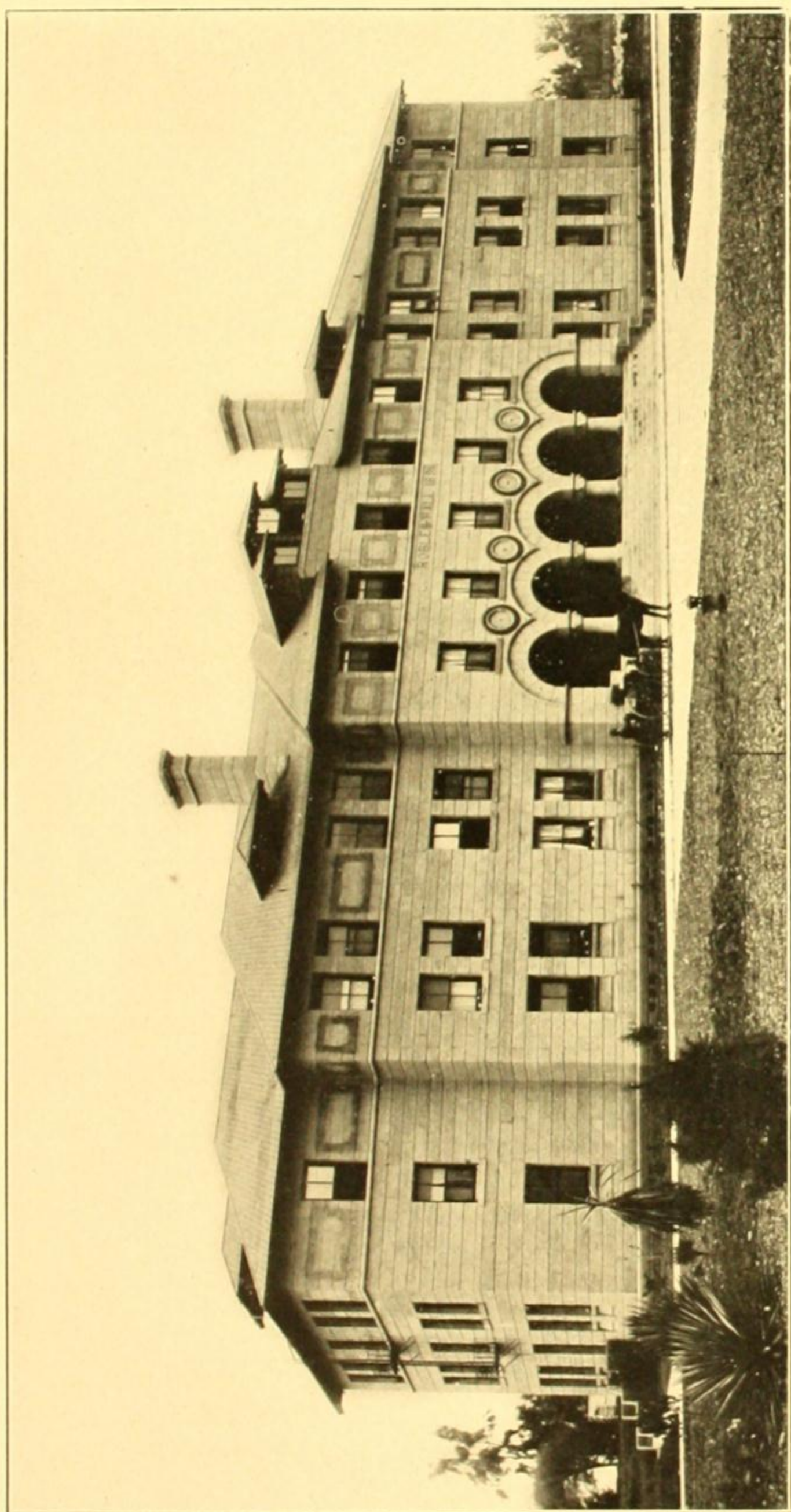
MACHINE SHOP.



Exterior View.



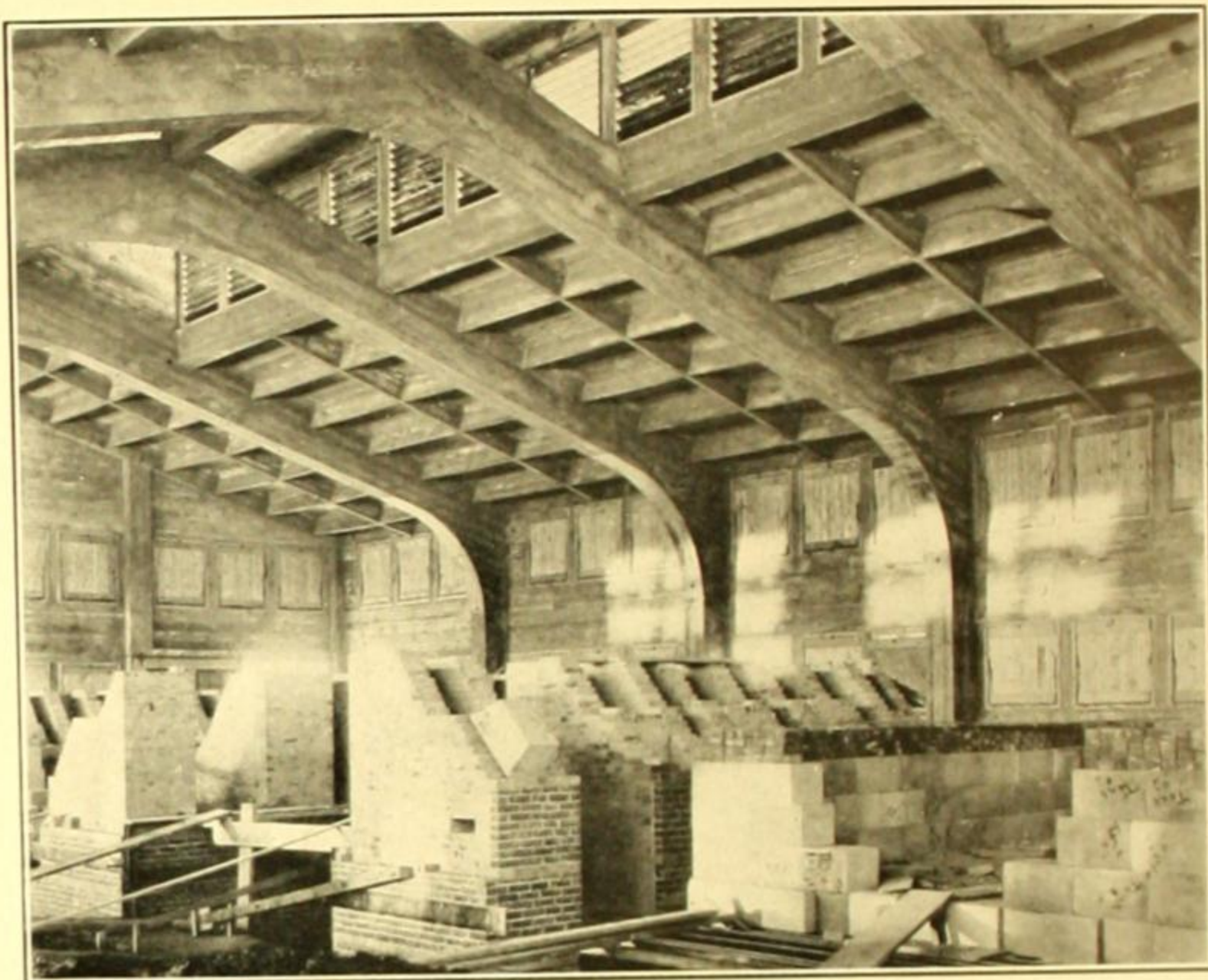
Interior View.



ROBLE HALL.

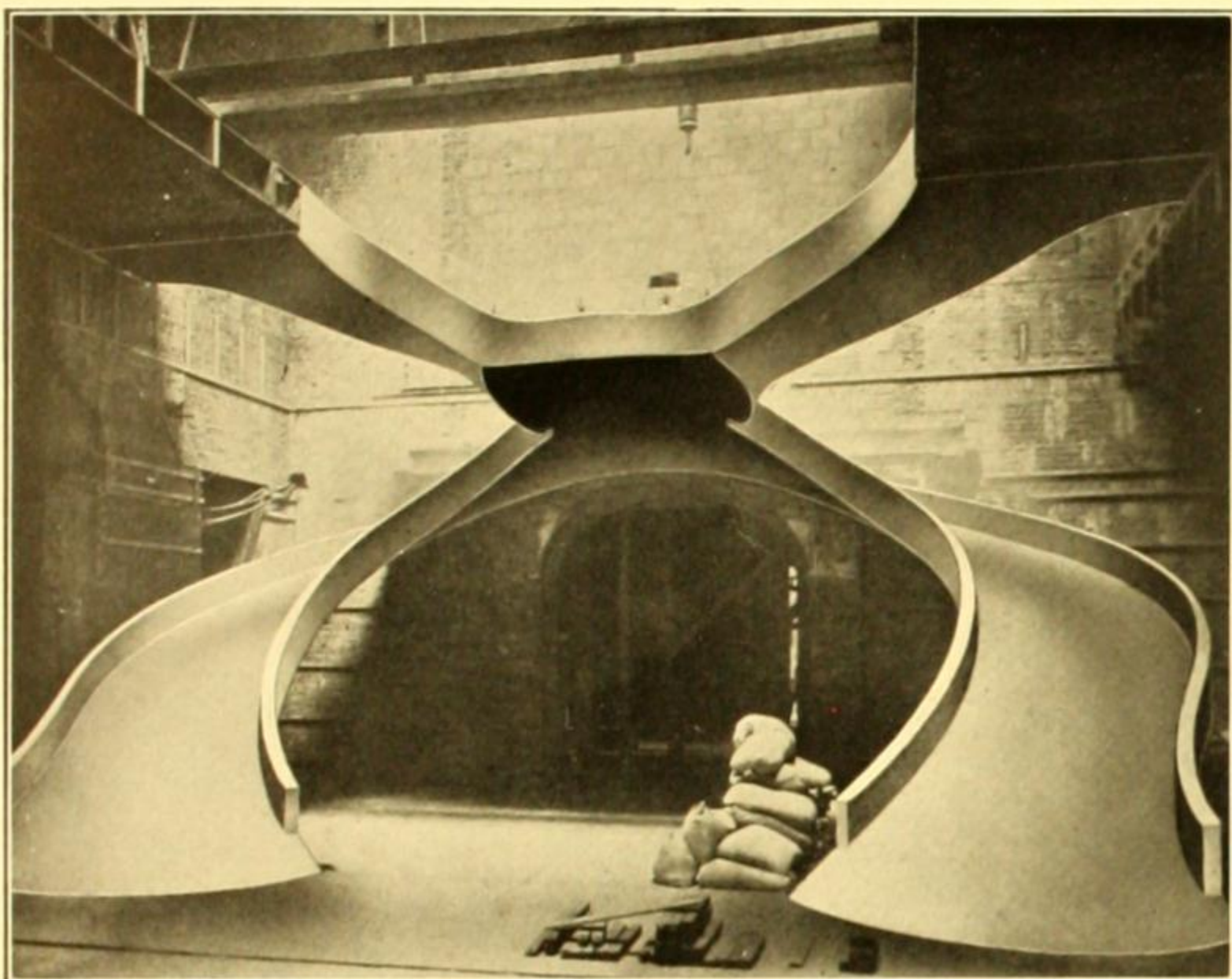
This building was erected in 1891, in connection with the Leland Stanford, Jr., University in California. The view shows the possibilities of plain although pleasing architecture in concrete. (Geo. W. Percy, Arch.)

NORTHWESTERN OHIO BOTTLE MACH. CO.

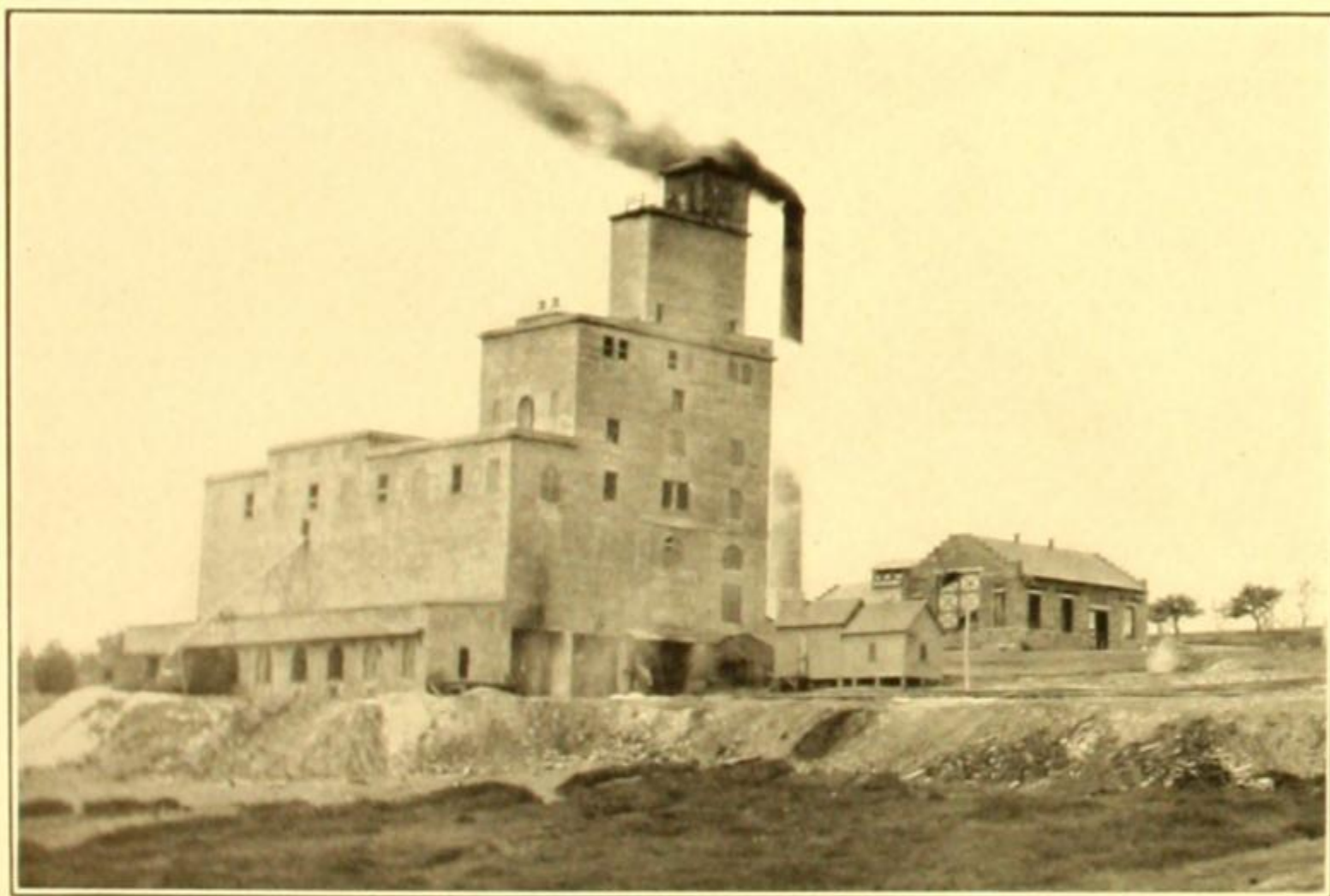


Interior View.

This building is a portion of the plant of the Northwestern Ohio Bottle Co., at Toledo, O., Mr. H. W. Wachter, Architect, The Henry J. Spieker Co., Contractors. The Ransome Co. were consulting and designing engineers for the reinforced concrete work, and the building is particularly noteworthy for the arches 60 ft. wide and 30 ft. high which span the room (as shown in the illustration) without any intermediate posts. When this work was designed (in 1904) it was without a parallel in this country, and it is even to-day among the largest arched roofs erected anywhere of reinforced concrete. The arch is a true reinforced concrete structure without any concealed riveted sections, and it stands to-day, as when erected, without any cracks or blemishes.



SKELETON STAIRWAY.—Residence of Geo. W. Vanderbilt,
640 Fifth Ave., N. Y.
Ransome & Smith Co., Consulting Engineers for Reinforced Concrete.
Hunt & Hunt, Architects.



Sterling Salt Company's Breaker.

STERLING SALT COMPANY
MINERS & SHIPPERS OF
S A L T

New York, June 27th, 1912.

Ernest L. Ransome, Esq.,
Ransome Engineering Company,
90 West Street, New York City.

Dear Mr. Ransome :

We are pleased to report that the head house, breaker and bin building which you erected of reinforced concrete for this Company in 1906, have been entirely satisfactory.

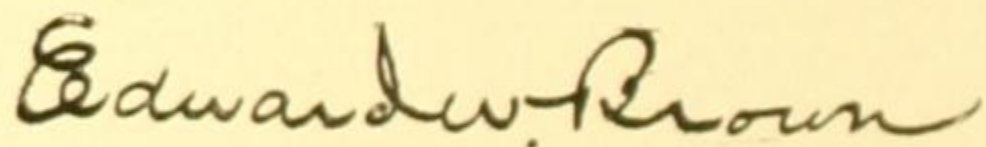
The head house, immediately over our shaft, is 125 feet in height and at the extreme top supports two sheave wheels, by means of which our heavy cages are raised and lowered at high speed. The dump is 105 feet above the surface, at which point the shaft cages are tilted and the salt dumped onto the grizzly bars. Immediately under these bars are located our heavy main crushers, so that a large amount of heavy moving machinery is housed in this building, many feet above the surface.

To the best of our knowledge, this was the first mine breaker building to be constructed in this Country of reinforced concrete and although we had some misgivings at the time of accepting your designs and placing the contract with you, we are now highly satisfied with such decision and regard our buildings as a great success in every way.

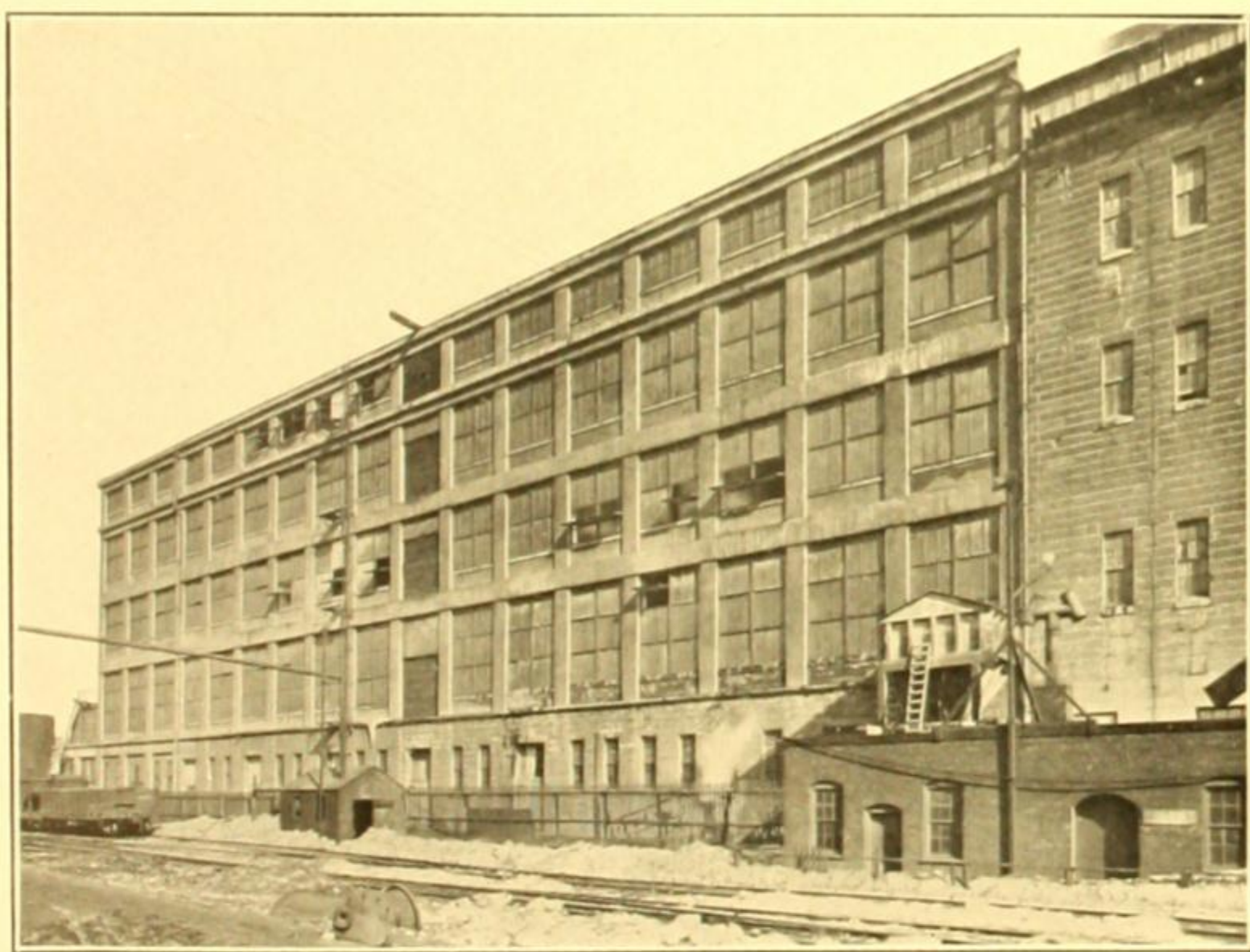
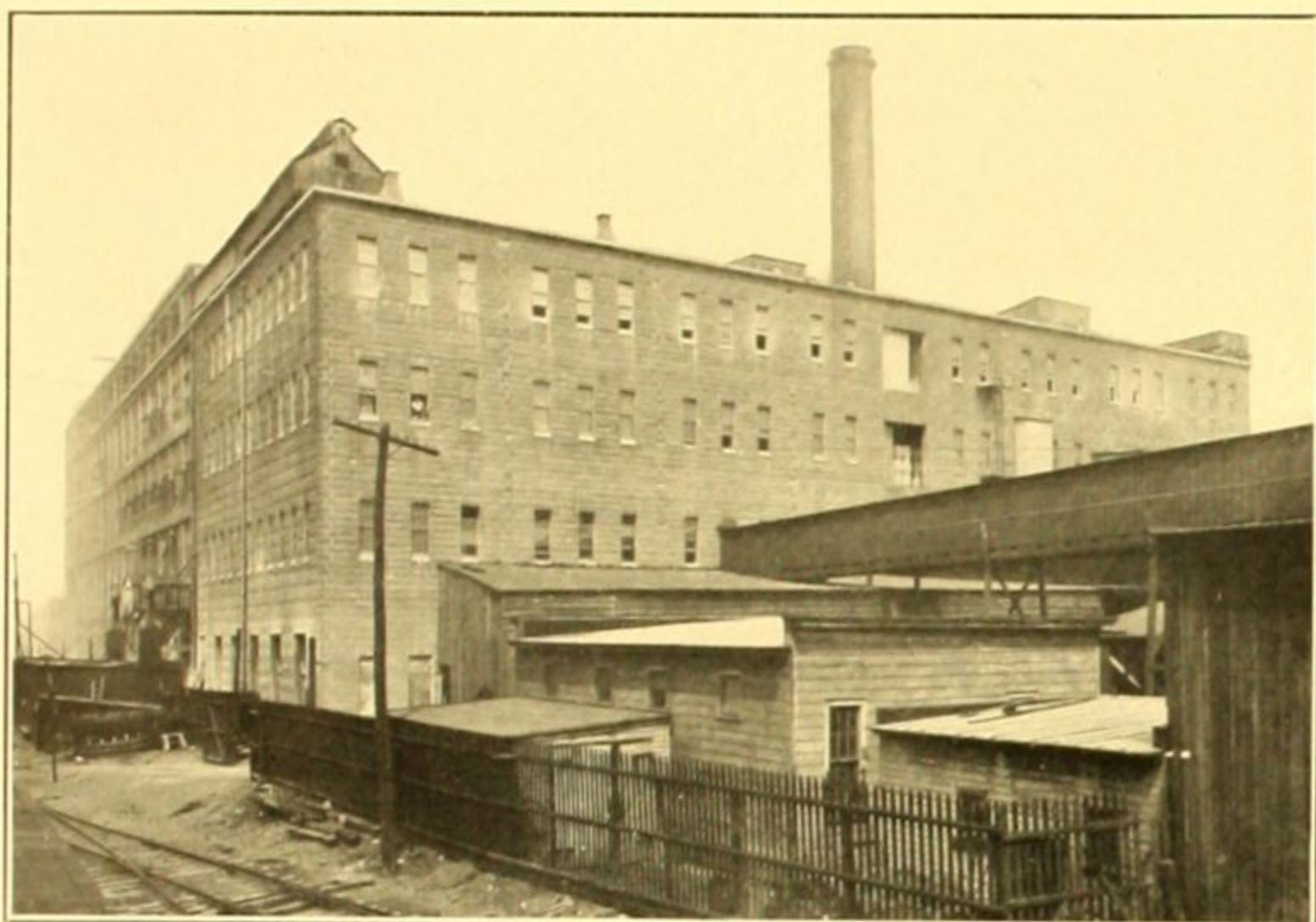
The other buildings of reinforced concrete which you constructed for us are the standard Ransome Unit type one-story building and have proved entirely satisfactory.

I enclose a photograph which gives a comprehensive view of our breaker building.

Yours very truly,

A handwritten signature in dark ink, reading "Edward W. Brown". The signature is written in a cursive style with a large, prominent initial "E".

Vice-President.



THE OLD AND THE NEW.

The upper view shows the old plant of the Pacific Coast Borax Co. at Bayonne, N. J., the first reinforced concrete factory erected in the East.

The lower view shows a more recent addition to the same factory, with plenty of light and ventilation.

PACIFIC COAST BORAX CO.

BORAX-BORIC ACID

100 WILLIAM STREET

New York, July 9th, 1912.

Mr. Ernest L. Ransome,
c/o Ransome Engineering Co.,
90 West Street, New York.

Dear Sir :

Answering your query as to whether the factory building you erected for us at Bayonne, N. J., about fifteen years ago, on the cost plus fixed sum basis, has been satisfactory, and also what its special advantages—if any—are : I beg to say the building has been satisfactory in every way.

As you know, since you erected the first building for us, we have had you erect additional buildings that, in the aggregate, are considerably larger than the first building you constructed. We would not, for a moment, consider putting up any building other than a concrete building of your construction.

Among some of the special features that occur to me, are :

FIRST.—Its being absolutely fire-proof. This was fully tested, as you well know, by the fire which we had in our Calcining Department. The feed pipe conveying the fuel oil to the burner, broke just back of the burner, flooding the floor with burning oil, making a fire of terrific heat, melting all exposed metal and burning all combustible partitions, etc., that the building at that time contained, but the concrete building itself stood the test magnificently, and as our property is surrounded by stills of the Standard Oil Co. this is a particularly important feature to us and we know that our building is absolutely fire-proof.

SECOND.—Cost of repairs. No expenditure under this heading is made—the building being monolithic and like Spanish Wine, improves with age.

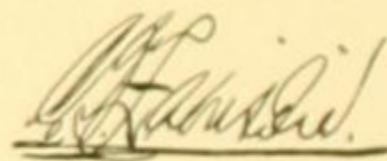
THIRD.—Strength. As you know, we carry terrific loads on our floors—on our fourth floor carrying a weight of 1430 lbs. per sq. ft. On the lower floors we have carried much heavier weights without straining the building in the least.

FOURTH.—Cleanliness. Your construction is an ideal construction for a factory as it can be kept perfectly clean—it being a simple matter to hose and wash it out.

We believe that concrete construction is the proper construction and that the Ransome system is the best system. It is vitally important that the construction is under a thoroughly competent man. Our factory buildings are certainly a convincing demonstration of what can be done with concrete with your system, and they have more than fulfilled every guarantee you gave.

Yours very truly,

PACIFIC COAST BORAX CO.,



Eastern Manager.

C.B.Z.-RS

WHAT THE PRESS SAYS :

CEMENT, Vol. 4, May, 1903, No. 2, p. 101, states :

"It cannot be doubted that the early examples of work in concrete carried to successful completion under the direction of Mr. E. L. Ransome, and the steady progress he has made in applying cement to a variety of uses, has done more towards increasing the use of Portland Cement than any other single agency."

AMERICAN MACHINIST, Vol. 30, No. 45, Nov. 7, 1907, p. 705, in "Advances in Factory Construction," states :

"It is impossible to describe these structures without entering into the labors of the Nestor in the art of building reinforced concrete, E. L. Ransome. It is authoritatively accepted that on American soil was erected the first building whose material of construction was what is now known as reinforced concrete. Curiously enough, this building was built for factory purposes. It was built by Mr. Ransome in 1887 or 1888, for the Pacific Coast Borax Company, at Alameda, Cal."

BULLETIN, No. 12, Association of American Portland Cement Manufacturers, 1906, states :

"Ernest L. Ransome, then of San Francisco, from 1885 to 1890 was engaged in applying his discoveries to works of the most elaborate and extensive character. When we take into consideration that at that time the state of reinforced concrete was in the most elementary, experimental stage, we can bestow the greater credit and honor upon him for the courage and splendid mechanical and engineering ability, which he displayed in undertaking the construction of steel concrete buildings of such magnitude in a country subject to earthquakes ; and the value of his discoveries has been further accentuated by the fact that during the recent great earthquake in California all of the above structures came through the ordeal unscathed, where buildings of brick and stone in their immediate vicinity were entirely wrecked."

“CONCRETE FACTORIES”—CEMENT AGE”:

“Ernest L. Ransome, the pioneer of reinforced construction in U. S. It is mainly due to Ransome’s missionary work that reinforced concrete construction has reached its present commanding position in building construction; he kept up an active propaganda on the subject and paved the way for the widespread introduction of this new form of construction. An instructive index of the effect of this constant hammering away is offered by the figures showing the growth of the production of Portland cement coincident with the spread of reinforced concrete construction. While in 1890, when Ransome began his crusade, the production was only 300,000 barrels; it had increased to 36,000,000 barrels in 1905, one of the most remarkable instances of results of persistency upon an industry in recent times.”

“BETON u EISEN,” Germany, referring to Mr. Ransome, observes:

“He published a pamphlet on his work as early as 1894, an important historical document on steel-concrete. Ransome was at that time in a position to draw attention to two large and important applications of his system of construction of particular interest, being the first large applications of steel-concrete. These are historical, and may be considered previous to all European beam constructions. We refer to the Museum Building, Leland-Stanford University, and the building of the Pacific Coast Borax Company. Altogether, Ransome’s life shows that he is a great pioneer, and must be named in the first rank.”

THE RANSOME PATENTS.

The Ransome Companies have developed two distinct methods of erecting reinforced concrete buildings: first, the RANSOME MONOLITHIC, in which all the concrete is deposited in forms in its final position; second, the RANSOME UNIT, in which the important members are manufactured on the ground and afterwards erected same as steel or timber construction, while the slab portion also in this case is cast on temporary centers in its final position.

Both of these methods are covered by United States Patents.

THE MONOLITHIC PATENT, No. 694,580 (March 4, 1902, to Ernest L. Ransome) contemplates the extension of the floor slab to the face of the building where it forms a belt course, capping the piers and also the extension of the floor to form window heads and sills, eventually utilized as beams. Claims 5 to 10 of this patent have recently been sustained by the Court. (Ransome Concrete Co. vs. German-American Button Co., Judge Hazel in the United States District Court, Western District of New York, June 1912: "A decree may be entered, with costs, holding claims 5 to 10 inclusive, valid, and infringed by the defendant corporation"). This construction is now so well known that it is not necessary to enlarge upon it here.

THE UNIT PATENTS, Nos. 694,577 and 918,699 (March 4, 1902 and April 20th, 1909), to Ernest L. Ransome, contemplate (1) the tying together of the separately molded and subsequently erected beam to the slab which is molded in place, and (2) the erection of tall buildings under this same system. This construction leads to economy, saving sometimes as much as Fifteen to Twenty per cent. and gives additional safety and better workmanship.

THE RANSOME UNIT SYSTEM.

UNIT CONSTRUCTION IS THE SAFEST CONSTRUCTION possible. When desired, the pieces can be tested in the yard before setting, but under any circumstances, the handling and setting is in itself an excellent test.

THE RANSOME UNIT CONSTRUCTION IS A RATIONAL and legitimate development of sound engineering. The several pieces are tied together as efficiently as in any other type of construction (1) by means of the slab which is cast in place over the entire floor area, and (2) by means of carefully designed tie rods. The joint between the beam and the slab DOES NOT INFLUENCE THE STRENGTH of the floor when proper U'bars or stirrups are provided for. This has been conclusively shown by an extensive series of tests on twenty-eight full size beams, by Professor Lewis J. Johnson of Harvard University. These tests gave the following results :

Type A	No.	1 Unit	Ultimate Load	49400 lbs.
	2	"	" "	54300 "
	4	"	" "	48000 "
	5	"	" "	41000 "
	9	Monolith	" "	50000 "
	10	"	" "	52400 "
	12	"	" "	45800 "
Type B	No.	25 Unit	" "	42500 "
		No. 27 Monolith	" "	47500 "
Type C	No.	13 Unit	" "	50000 "
	20	"	" "	55600 "

The figures for the other beams tested are not available at this present time, but the results agree closely with what is shown here. Professor Johnson's complete report will probably be made public shortly ; in the meantime, further details of these tests may be found in Ransome & Saurbrey : Reinforced Concrete Buildings (McGraw-Hill Book Co. 1912.)

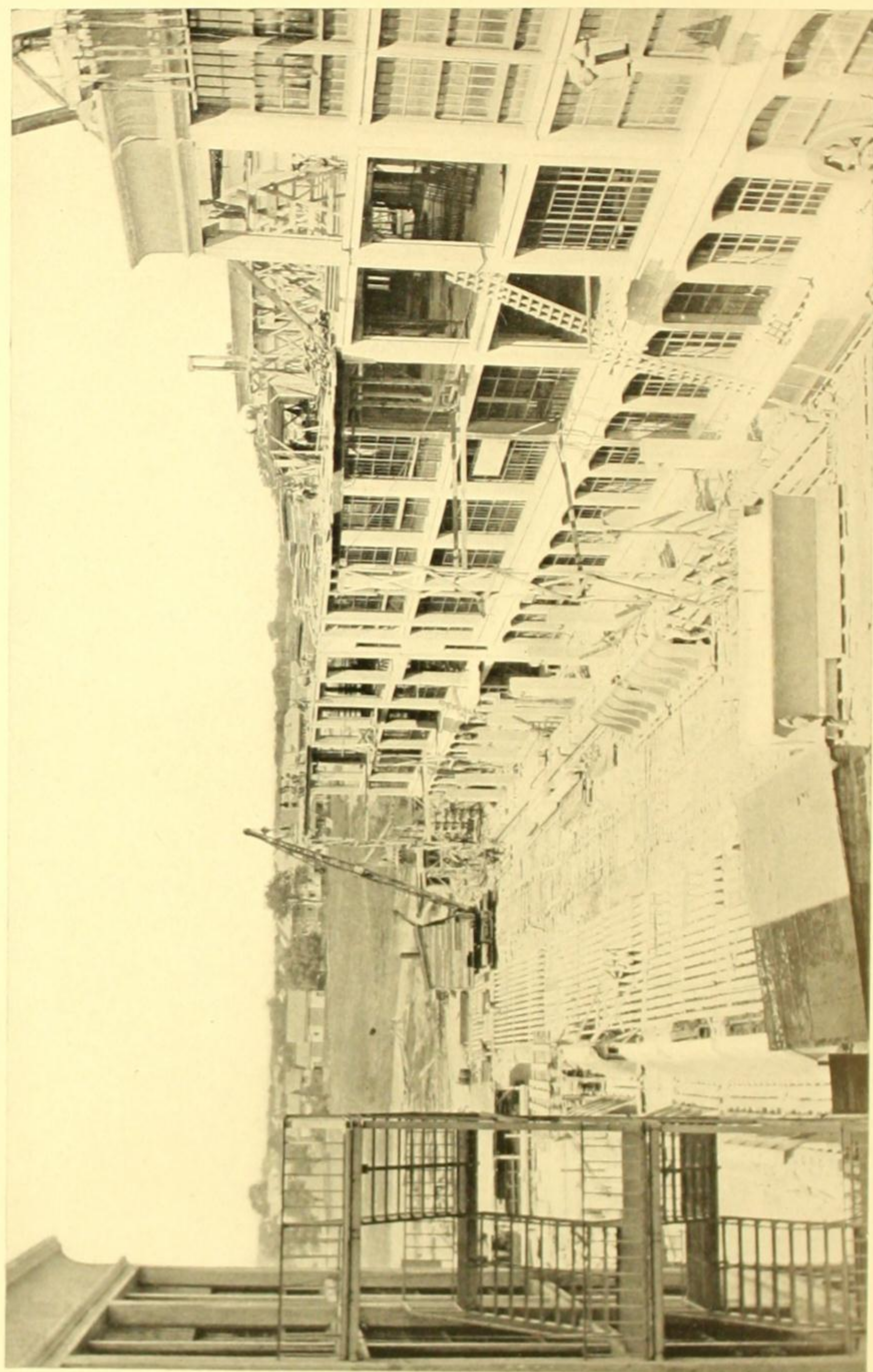
THE RANSOME UNIT SYSTEM.



This view shows the possibilities in wall construction, the slabs being cast on the ground practically without molds. The first panel is cast on a sand bed, and given a non-adhesive coat, the next slab is cast on top of the first and so on, until a stack of slabs has been completed. The slabs are set when hard, usually in about 8 to 10 days time. In some cases the windows are cast in the panel, but usually they are set afterwards.

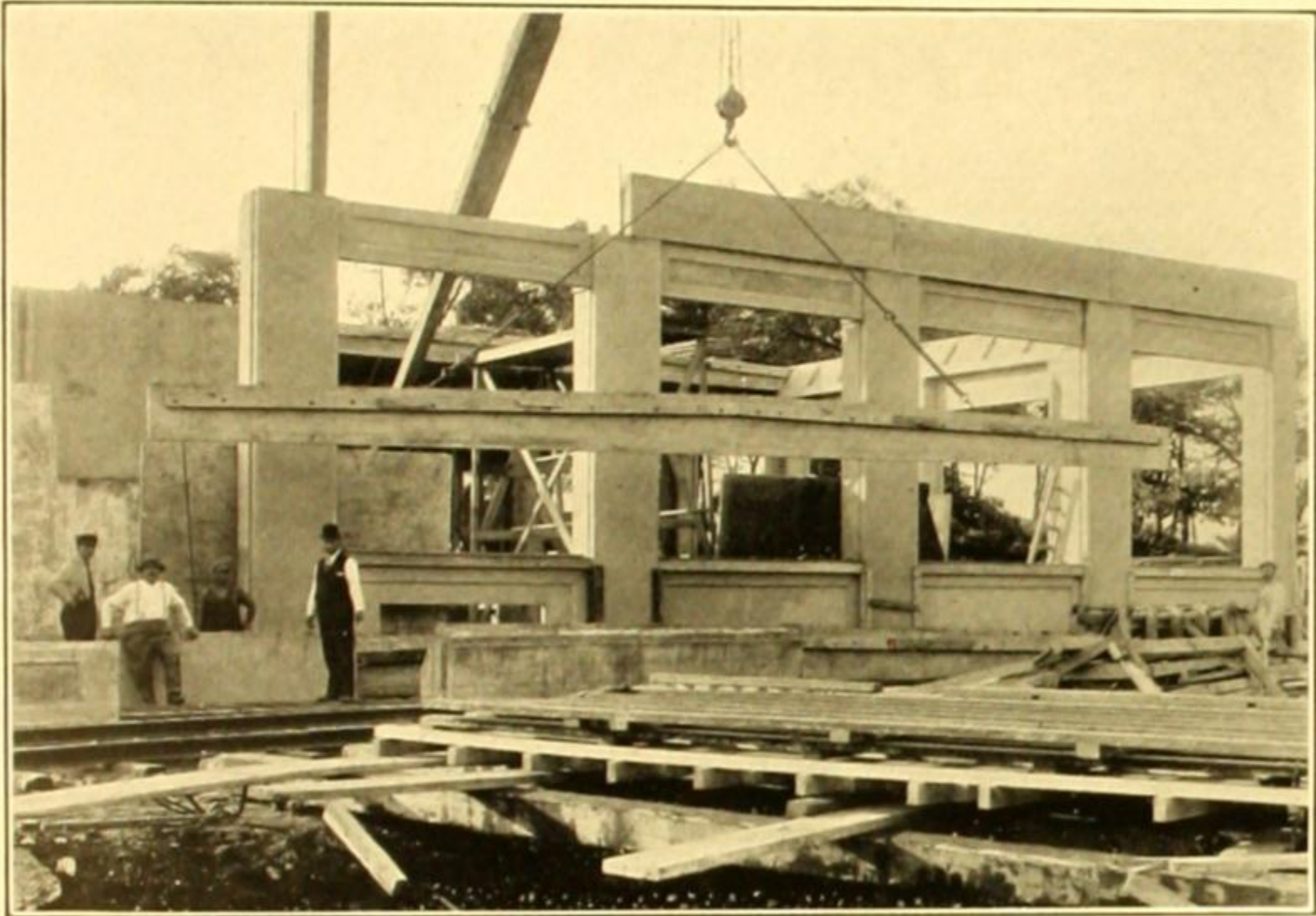
The slabs are lightly reinforced and have toggles for lifting. After the slab is set, the joints between slab and column are carefully grouted or pointed.

The view on the opposite page shows a large four-story building under erection, with the casting yard in plain sight. The beams and girders are made opposite the place where they are to be erected and alongside the building a row of columns may be seen. The cornice even is cast on the ground; four cornice-pieces are on the ground ready to hoist while one piece has already been set. After the several members are placed, the FLOOR IS CAST IN PLACE.



View of CASTING YARD for one of the large buildings built under the Ransome Unit System.

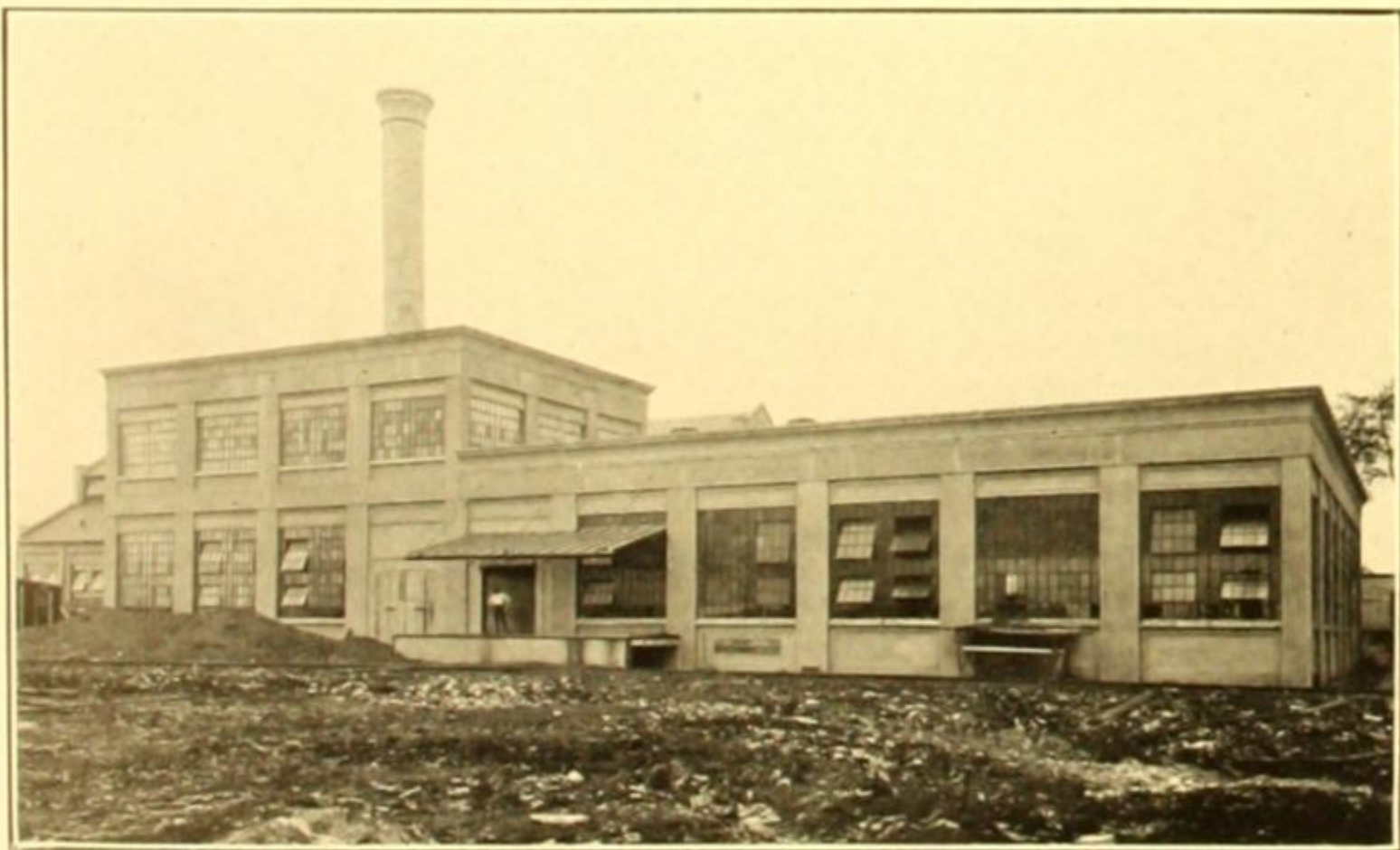
THE RANSOM UNIT SYSTEM.



Drop Forge Building—under Construction.

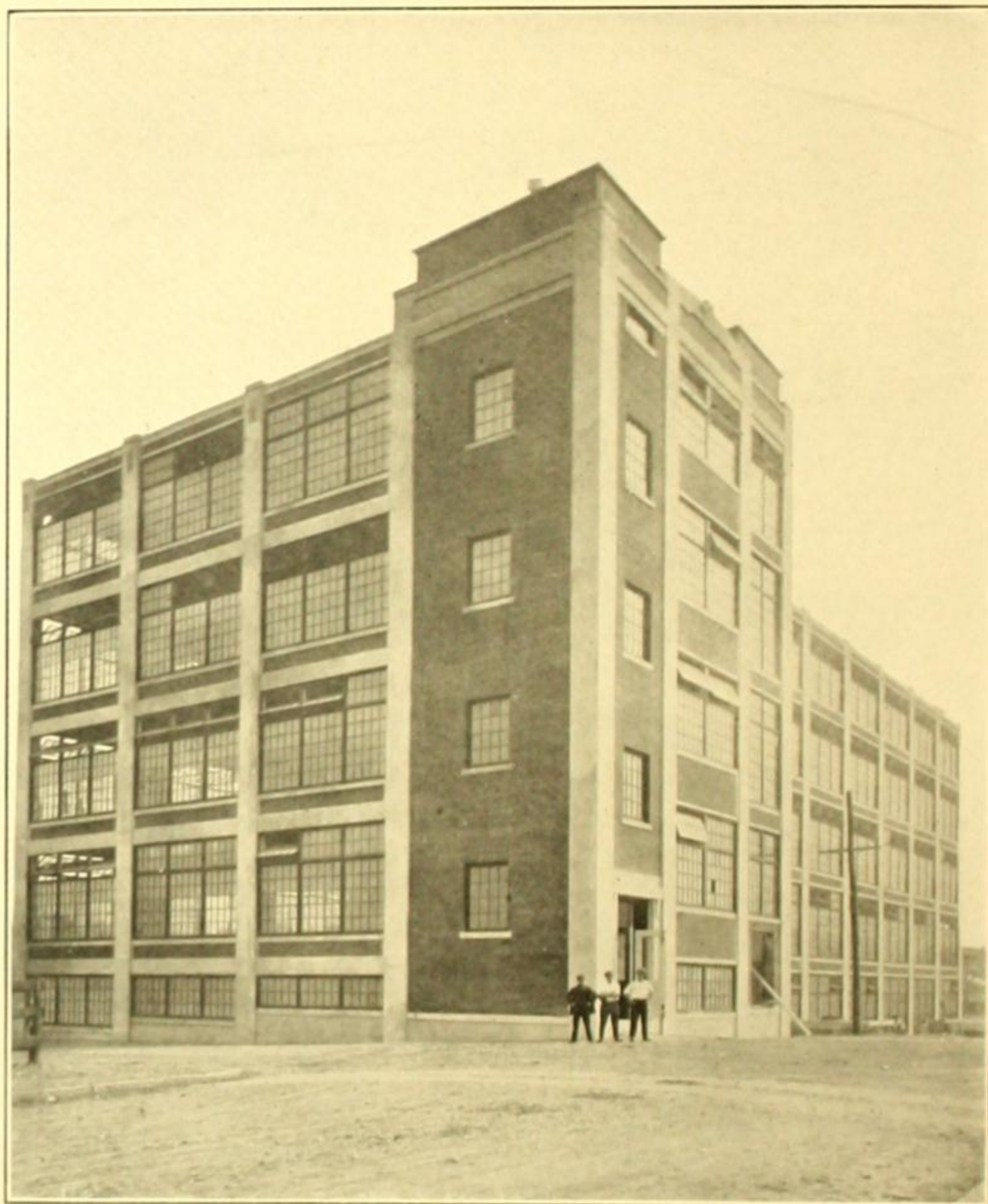
The above photograph shows a corner of a one-story building under construction. The long beam is being hoisted with wooden stringers attached upon which the loop forms are to rest. The window heads and cap stones have already been set, as well as the curtain walls below. In the left-hand background may be seen some large 3" concrete slabs.

A derrick with a 60 ft. boom was used for erection.



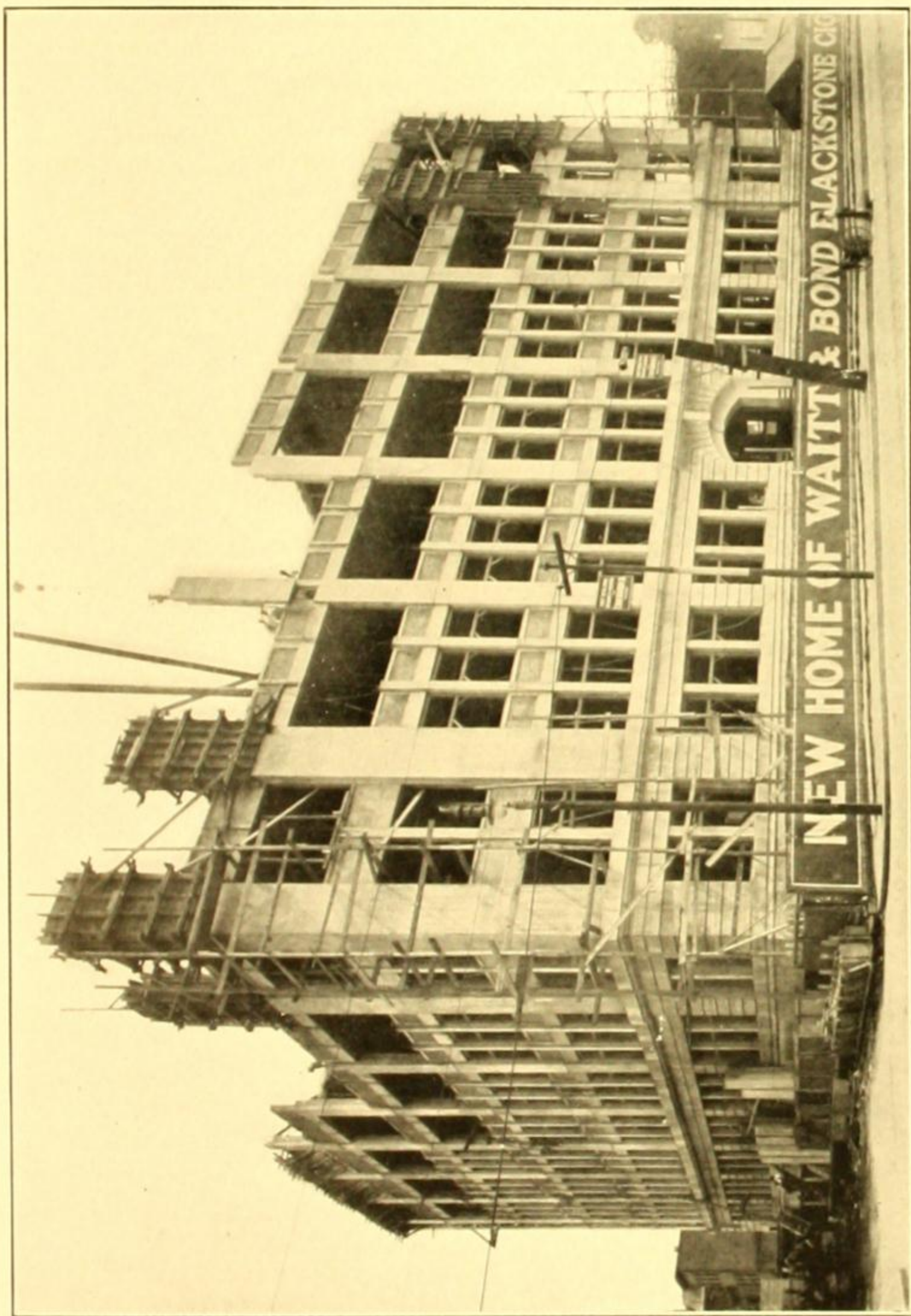
Drop Forge Building—Completed.

THE RANSOME UNIT SYSTEM.



Building in East Boston, Mass., erected under the Ransome Unit System.

THE RANSOME UNIT SYSTEM.



Building erected in Boston, Mass., under the Ransome Unit System.

The large corner columns were cast in place owing to their size; the balance is all Unit work.

A TEXT BOOK ON REINFORCED CONCRETE.

RANSOME AND SAURBREY:
REINFORCED CONCRETE BUILDINGS.

A treatise on the history, patents, design and erection of the principal parts entering into a modern reinforced concrete building.

McGraw-Hill Book Co.,
New York.
1912.

REVIEW IN ENGINEERING NEWS:

No book precisely similar to this one has appeared among the voluminous writings on concrete and reinforced concrete. It is an attempt to present in an expository manner the salient features of the design and construction of reinforced concrete buildings Mr. Ransome's reminiscences are particularly interesting His story is admirably rounded out by the succeeding chapters The portion on design is a plain statement of the requirements of the various members which go to make up a reinforced concrete building, arranged in quite rational fashion The section on practical construction is particularly good on account of its simplicity as a whole the book is a very good addition to the subject of reinforced concrete. The method of treatment is very clear throughout and there is a pleasant absence of confused statements and unnecessary verbiage

REVIEW IN ENGINEERING RECORD:

. Mr. Ransome is the Nestor of American reinforced concrete engineers and contractors, and an authoritative statement of the subject from his point of view must of necessity be of interest to those interested in that line of engineering work. A considerable portion of the book is devoted to a history of the subject, by him, entitled "Personal Reminiscence" followed by a chapter on the history of patents for reinforced concrete inventions.

Part II, which contains the theoretical analysis of the subject, has been made as brief and concise as seemed consistent with its purpose as to the mathematics of the subject and a most careful discussion of the subject of transverse stresses and the use of U'bars

Part III is devoted to practical construction, as the authors state there is no necessity to-day for describing at great length the various types of buildings or their component parts except unit construction. With regard to this type, the fact that Mr. Ransome is appropriating the latest improvements in the line of work that he so comprehensively started shows his breadth of view and gives added interest to his work. The chapters on fireproofing and repairs should be of interest

